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OPEN LETTERS.

A MEXICAN TROPICAL BOTANIC STATION.

THE BOTANICAL GAZETTE during the past three years has agitated in its editorial columns and by the publication of open letters the establishment of a tropical botanical laboratory. The consensus of opinion seems to be that such a laboratory should be situated in Jamaica, which would be easily accessible both to English and American botanists. Jamaica has, without a doubt, many advantages over other localities in the western tropics. The late Professor J. E. Humphrey in a letter to the *GAZETTE* refers to the peculiar conditions which make Jamaica a suitable place for such a laboratory :

As compared with many other parts of the tropics, the climate of Jamaica is exceptionally healthful, and it is remarkably free from poisonous animals. Its continental character makes possible a rich and varied flora, and within a few miles one may pass from the sea level to the summit of the Blue mountains, 7360 feet high. The island is a British colony, which means that life and property are secure, the roads fine, the language English. It is accessible by steamer at least once a week from either Boston, New York, Philadelphia, or Baltimore, and the principal points are now connected by railroad. There are on the island two interesting botanic gardens at Castleton and Gordon Town under the direction of Mr. Wm. Fawcett, Director of Public Gardens and Plantations, who would doubtless give such an enterprise every encouragement and much valuable aid.

All these advantages seem to point to Jamaica as the most suitable place for the establishment of such a tropical laboratory, where much needed botanical research can be prosecuted. Professor Goebel is quoted in the *GAZETTE*¹ as saying :

It appears to me particularly desirable that the laboratory should be placed near a botanical garden, because of the greater number of plant forms available, besides the herbarium and library, as well as the opportunities for experimental culture afforded. Furthermore, another important condition would be the location of the laboratory as near as possible to the primitive forest.

However great the advantages of Jamaica may be for the study of tropical vegetation, it is advisable not to overlook other regions of the western hemisphere which are especially suitable for the botanical investigations which alone can be carried on in a tropical country. The writer wishes to make a plea for Mexico, not because he does not recognize the suitability of Jamaica, but

because he desires to call the attention of American and English botanists to several Mexican localities with which he is personally familiar, having visited them in the summer of 1896.

Orizaba.—Orizaba is a town of 15,000 inhabitants in the state of Vera Cruz, on the line of the Mexican railway, 82 miles from Vera Cruz, 181 miles from the City of Mexico, at an elevation of 4000 feet above the level of the sea. The town lies in a little valley surrounded by very fine mountains. The peak of Orizaba (17,356^{ft}), however, cannot be seen from the town, although within a half day's journey. The town is composed for the most part of low houses with red tiled roofs; it is crossed by two small streams and by the little river Orizaba (through a rocky ravine filled with tropical plants), all of which unite near by in the river Blanco. The region is especially rich in tropical orchids and epiphytes. The city is in close proximity to the *tierra caliente*, the *tierra templada*, and, on the sides of Mount Orizaba, to the *tierra fria*. A tramway extends from the station into the town, passing the doors of the hotels; another line extends to the pretty suburb Yngenio, and thence a little beyond to the Nogales station on the Mexican railroad. Of superb beauty and grandeur, affording fine botanizing ground, is the cañon of the Rincon Grande about three miles out of the town. Orizaba and the neighboring town of Cordoba (2000^{ft}) are easily reached by the Mexican railway from Vera Cruz after three hours' ride through grand and inspiring mountain scenery. Botanists from the central and eastern United States can reach Vera Cruz by steamer direct from New York, New Orleans, and Galveston. Botanists from the Pacific coast and from the Rocky mountain region can take the overland route from El Paso to the City of Mexico, and thence to Orizaba, passing across the interesting Mexican deserts and descending step by step from the elevated Mexican tableland in the *tierra templada* to Cordoba in the *tierra caliente*.

Jalapa.—Jalapa, reached from Vera Cruz and from the City of Mexico, also presents exceptional advantages for tropical botanical research.

It is, however, to neither of these places that the writer wishes to advert especially. It is to the little known and interesting region tributary to the town and seaport of Tampico on the Gulf coast. Tampico is too unhealthy for the establishment of a station there, although the region is of exceptional interest with the river Panuco and the Lago de Tamiahua giving access by canoes to the luxuriant tropical forest of the Gulf coast. If such a laboratory be established, it must be at sufficient elevation to have a salubrious climate. Such a place is found at a station on the Mexican Central railroad called Las Canoas, 144 miles distant from Tampico.

Las Canoas.—Las Canoas is situated in the beautiful basin-shaped valley of that name (3500^{ft} above sea level). The soil is a red clayey loam, and a stream, having its rise in a perennial spring, affords an abundant supply of

clear and limpid water. Good water is a very important item to strangers in a tropical country, especially in Mexico, where the streams are polluted by the frequent washing of clothes along their courses. The Valley of Las Canoas is shut in from the surrounding country by high hills, and is especially well situated for the establishment of a tropical laboratory. The air is clear and bracing, and food is easily obtained. Easy of access to the deserts on the table land above by the daily trains which run on the Mexican Central railroad to San Luis Potosi and thence to Aguas Calientes, the locality is especially well situated for botanizing. From Las Canoas by means of the railroad toboggan, or by train, one can descend through the grand and impressive Tamasopo cañon into the tropics. Mr. Pringle² has described the characters of the region in such an interesting pen picture, that the writer cannot refrain from quoting him at this point :

Gliding beside the stream of purest water issuing from the hillside cave, the train advances cautiously to the gate of the cañon cut out by the river formed by the stream which issues from the perennial spring uniting with another stream which rushes down through a wild and deep barranca behind the small village of Las Canoas. It enters above plunging, boiling waters. Then for eight or nine miles the roadbed has been cut in the rock of the steep mountain side, or has been laid on walls which spring from far below. On such dizzy heights the train hangs and sways and winds through constantly occurring curves. Where mountain buttresses interpose, tunnels open a way, till eight are passed. Within the cañon long vistas of the wildest mountain scenery open before us. The opposite mountain side is precipitous in places, in others cut by gorges. It is everywhere covered with a variety of trees, except here and there on the steeps near the summit, where some Indian has built his hut and cleared a plot for corn or bananas. From our perch, still high on the mountain, we are looking down upon a fertile hacienda, on broad open valleys stretching among low hills, which are covered with heavy tropical forests, on meadows with grazing herds, and on broad fields of corn and cane. In making the descent from the mountain side to Tamasopo siding, the road turns back upon itself in several long loops. At the foot of the mountain it passes through a heavy forest in whose shade is a coffee plantation. The region is in the one of heaviest rainfall. The winds, heavily laden with moisture which arises from the Gulf, are repelled from the heated lowlands, to precipitate on these mountains torrents of rain, as their temperature is lowered by their ascending into cooler regions of air. Yet the temperature of Tamasopo, though a little lower than that of the coast, is still a tropical heat; and from conditions of so great heat and moisture results a vegetation of great luxuriance. The forests, composed of numerous species, are thick, the undergrowth beneath them is dense, and trees and shrubs are bound together by clambering vines to form an almost impenetrable jungle. Each large tree, with huge spreading branches and leaning trunk, it may be, becomes a garden of plants. On its rough mossy surface root ferns, orchids, bromeliads, and cactuses; and lifted thus into the air and light they thrive apace. The most abundant tree of these tropical forests is doubtless a fig, *Ficus Segoviae*, with smooth gray bark, and often of vast size, especially when growing

² Garden and Forest 6: 182, 203. 1893.

beside streams. It is upon the fruit of this and other wild figs that pigs, peccaries, and monkeys, largely subsist. The most common oak here is *Quercus Germana*, which bears acorns two inches long. *Dendropanax arboreus*, symmetrical in form, and bearing attractive foliage and fruits, is one of the most interesting trees here; and *Banara Mexicana* is pretty when covered with white berries. From Tamasopo to the station at Rascon, where a good restaurant is kept, the road threads valleys and runs between wooded hills and a river bank. The clear blue water shows through gaps of the thickets covering the river banks, and here we first see clumps of a giant bamboo, in each clump five to ten stalks, every stalk four to six inches thick, a gracefully spreading plume twenty to forty feet high. Scattered palm trees soon appear, and as we near Rascon we are running through a forest of palms, straight, slender shafts, thirty feet high, bearing heads of broad leaves. Beyond Rascon, as far as Micos, are more palm forests and bamboos, and rivers and swamps and jungles, alternating with open meadows, which lead back between hills whose sides are covered with oaks. Meadows and glades and mountain tops—all are deer parks; and the Mexican tiger, the puma, prowls through the less frequented wilds of all this region.

On every hand is rich and inviting botanizing ground in an unbroken virgin forest.

Las Canoas is reached from Tampico on the Gulf coast. Tampico is reached by line of steamers from Galveston, New Orleans, New York, and European ports. Leaving Tampico at 6:00 A.M., Rascon (116 miles distant) is reached at 11:20 A.M.; Las Canoas, 144 miles distant from Tampico, at 1:35 P.M.; and Cardenas, where the mountain engines are taken off, at an elevation of 4500 feet, 158 miles distant, at 2:20 P.M. From Rascon to Cardenas (42 miles) an ascent is made of 3500 feet. The Tampico branch of the Mexican Central railroad, passing through San Luis Potosi, makes connection with the main line at Chicalote. The region tributary to this line from Tampico to San Luis Potosi has been visited by Mr. C. G. Pringle, so that American and European herbaria are well supplied with the representative plants of the region.

No more inviting district is within easy access of the American botanist than this one, tributary to the Tampico branch of the Mexican Central railroad. A temporary station could be established here at very little expense and the virgin forest would supply enough botanical material for years to come.—JOHN W. HARSHBERGER, *University of Pennsylvania*.